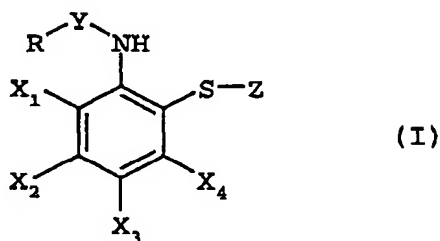


# Claims

1. A CETP activity inhibitor comprising as an active ingredient a compound represented by formula (I):



wherein

R represents

- a straight chain or branched C<sub>1-10</sub> alkyl group;
- a straight chain or branched C<sub>2-10</sub> alkenyl group;
- a halo-C<sub>1-4</sub> lower alkyl group;
- a substituted or unsubstituted C<sub>3-10</sub> cycloalkyl group;
- a substituted or unsubstituted C<sub>5-8</sub> cycloalkenyl group;
- a substituted or unsubstituted C<sub>3-10</sub> cycloalkyl C<sub>1-10</sub> alkyl group;
- a substituted or unsubstituted aryl group;
- a substituted or unsubstituted aralkyl group; or
- a substituted or unsubstituted 5- or 6-membered heterocyclic group having 1-3 nitrogen, oxygen, or sulfur atoms,

X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, and X<sub>4</sub> may be the same or different and represents

- a hydrogen atom;
- a halogen atom;
- a C<sub>1-4</sub> lower alkyl group;
- a halo-C<sub>1-4</sub> lower alkyl group;
- a C<sub>1-4</sub> lower alkoxy group;
- a cyano group;
- a nitro group;
- an acyl group; or
- an aryl group,

Y represents

- CO-; or
- SO<sub>2</sub>, and

Z represents

a hydrogen atom; or  
 a mercapto-protecting group selected from the group consisting of  
     a C<sub>1-4</sub> lower alkoxymethyl group,  
     a C<sub>1-4</sub> lower alkylthiomethyl group,  
     an aralkyloxymethyl group having an aryl group selected from  
 phenyl, biphenyl, and naphthyl,  
     an aralkylthiomethyl group having an aryl group selected from  
 phenyl, biphenyl, and naphthyl,  
     a C<sub>3-10</sub> cycloalkyloxymethyl group,  
     a C<sub>5-8</sub> cycloalkenyloxymethyl group,  
     a C<sub>3-10</sub> cycloalkyl C<sub>1-10</sub> alkoxymethyl group,  
     an aryloxymethyl group having an aryl group selected from phenyl,  
 biphenyl, and naphthyl,  
     an arylthiomethyl group having an aryl group selected from  
 phenyl, biphenyl, and naphthyl,  
     an acyl group,  
     an acyloxy group,  
     an aminocarbonyloxymethyl group,  
     a thiocarbonyl group, and  
     a thio group,  
 provided that R is not a methyl group when Y is -CO-,  
 or a prodrug compound, a pharmaceutically acceptable salt, a hydrate,  
 or a solvate thereof.

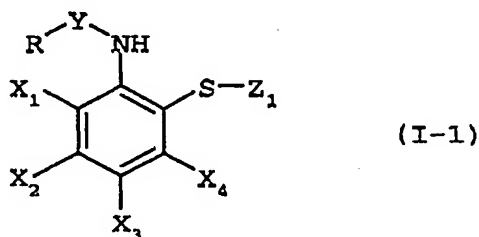
2. The CETP activity inhibitor comprising as an active ingredient  
 the compound as claimed in claim 1, wherein

R represents

a straight chain or branched C<sub>1-10</sub> alkyl group;  
 a straight chain or branched C<sub>2-10</sub> alkenyl group;  
 a halo-C<sub>1-4</sub> lower alkyl group substituted with 1-3 halogen atoms  
 selected from fluorine, chlorine, and bromine;  
 a C<sub>3-10</sub> cycloalkyl group, a C<sub>5-8</sub> cycloalkenyl group, or a C<sub>3-10</sub> cycloalkyl  
 C<sub>1-10</sub> alkyl group, each of which may have 1-4 substituents selected  
 from the group consisting of  
     a straight chain or branched C<sub>1-10</sub> alkyl group,  
     a straight chain or branched C<sub>2-10</sub> alkenyl group,

a C<sub>3-10</sub> cycloalkyl group,  
 a C<sub>5-8</sub> cycloalkenyl group,  
 a C<sub>3-10</sub> cycloalkyl C<sub>1-10</sub> alkyl group,  
 an aryl group selected from phenyl, biphenyl, and naphthyl,  
 an oxo group, and  
 an aralkyl group having an aryl group selected from phenyl, biphenyl, and naphthyl; or  
 an aryl, aralkyl, or 5- or 6-membered heterocyclic group with 1-3 nitrogen, oxygen or sulfur atoms, each of which may have 1-4 substituents selected from the group consisting of  
 a straight chain or branched C<sub>1-10</sub> alkyl group,  
 a straight chain or branched C<sub>2-10</sub> alkenyl group,  
 a halogen atom selected from fluorine, chlorine, and bromine,  
 a nitro group, and  
 a halo-C<sub>1-4</sub> lower alkyl group having a halogen atom selected from fluorine, chlorine, and bromine;  
 or a prodrug compound thereof, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

3. The CETP activity inhibitor comprising as an active ingredient the compound as claimed in claim 2, which is represented by the formula (I-1):



wherein

R represents

a straight chain or branched C<sub>1-10</sub> alkyl group;  
 a straight chain or branched C<sub>2-10</sub> alkenyl group;  
 a halo-C<sub>1-4</sub> lower alkyl group substituted with 1-3 halogen atoms selected from fluorine, chlorine, and bromine;  
 a C<sub>3-10</sub> cycloalkyl group, a C<sub>5-8</sub> cycloalkenyl group, or a C<sub>3-10</sub> cycloalkyl

C<sub>1-10</sub> alkyl group, each of which may have 1-4 substituents selected from the group consisting of

- a straight chain or branched C<sub>1-10</sub> alkyl group,
- a straight chain or branched C<sub>2-10</sub> alkenyl group,
- a C<sub>3-10</sub> cycloalkyl group,
- a C<sub>5-8</sub> cycloalkenyl group,
- a C<sub>3-10</sub> cycloalkyl C<sub>1-10</sub> alkyl group,
- an aryl group selected from phenyl, biphenyl, and naphthyl,

- an oxo group, and

- an aralkyl group having an aryl group selected from phenyl, biphenyl, and naphthyl; or

- an aryl, aralkyl, or 5- or 6-membered heterocyclic group with 1-3 nitrogen, oxygen or sulfur atoms, each of which may have 1-4 substituents selected from the group consisting of

- a straight chain or branched C<sub>1-10</sub> alkyl group,
  - a straight chain or branched C<sub>2-10</sub> alkenyl group,
  - a halogen atom selected from fluorine, chlorine, and bromine,
  - a nitro group, and

- a halo-C<sub>1-4</sub> lower alkyl group having a halogen atom selected from fluorine, chlorine, and bromine;

- X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, and X<sub>4</sub> may be the same or different and represents a hydrogen atom;

- a halogen atom;

- a C<sub>1-4</sub> lower alkyl group;

- a halo-C<sub>1-4</sub> lower alkyl group;

- a C<sub>1-4</sub> lower alkoxy group;

- a cyano group;

- a nitro group;

- an acyl group; or

- an aryl group,

- Y represents

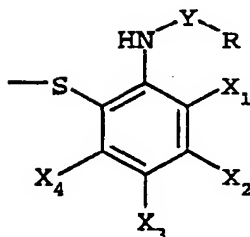
- CO-; or

- SO<sub>2</sub>, and

- Z<sub>1</sub> represents

- a hydrogen atom;

a group represented by the formula



wherein R, X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>, and Y are the same as described above;  
-Y<sub>1</sub>R<sub>1</sub>,

wherein Y<sub>1</sub> represents -CO-; or  
-CS-, and

R<sub>1</sub> represents

a substituted or unsubstituted straight chain or branched C<sub>1-10</sub> alkyl group;

a C<sub>1-4</sub> lower alkoxy group;

a C<sub>1-4</sub> lower alkylthio group;

a substituted or unsubstituted amino group;

a substituted or unsubstituted ureido group;

a substituted or unsubstituted C<sub>3-10</sub> cycloalkyl group;

a substituted or unsubstituted C<sub>3-10</sub> cycloalkyl C<sub>1-10</sub> alkyl group;

a substituted or unsubstituted aryl group;

a substituted or unsubstituted aralkyl group;

a substituted or unsubstituted arylalkenyl group;

a substituted or unsubstituted arylthio group;

a substituted or unsubstituted 5- or 6-membered heterocyclic group having 1-3 nitrogen, oxygen, or sulfur atoms; or

a substituted or unsubstituted 5- or 6-membered heteroarylalkyl group; or

-S-R<sub>2</sub>,

wherein R<sub>2</sub> represents

a substituted or unsubstituted C<sub>1-4</sub> lower alkyl group; or

a substituted or unsubstituted aryl group,

or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

4. The CETP activity inhibitor comprising as an active ingredient the compound as claimed in claim 3, wherein

$R_1$  represents

a straight chain or branched  $C_{1-10}$  alkyl group which may have 1-3 substituents selected from the group consisting of

a halogen atom selected from fluorine, chlorine, and bromine,

a  $C_{1-4}$  lower alkoxy group,

an amino group that may be substituted with a  $C_{1-4}$  lower alkyl, acyl, or hydroxyl group,

a  $C_{1-4}$  lower alkylthio group,

a carbamoyl group,

a hydroxyl group,

an acyl group,

an acyloxy group having an acyl group,

a carboxyl group, and

an aryloxy group that may be substituted with a halogen atom selected from fluorine, chlorine, and bromine;

a  $C_{1-4}$  lower alkoxy group;

a  $C_{1-4}$  lower alkylthio group;

an amino or ureido group that may have 1-2 substituents selected from the group consisting of

a  $C_{1-4}$  lower alkyl group,

a hydroxyl group,

an acyl group, and

an aryl group that may be substituted with a lower  $C_{1-4}$  alkoxy group;

a  $C_{3-10}$  cycloalkyl or  $C_{3-10}$  cycloalkyl  $C_{1-10}$  alkyl group that may have substituents selected from the group consisting of

a straight or branched  $C_{1-10}$  alkyl group,

a  $C_{3-10}$  cycloalkyl group,

a  $C_{5-8}$  cycloalkenyl group,

an aryl group,

an amino group,

a  $C_{1-4}$  lower alkylamino group having a  $C_{1-4}$  lower alkyl group,

and

an acylamino group having an acyl group;  
an aryl group, an aralkyl group, an arylalkenyl group, or an arylthio group, each of which may have 1-4 substituents selected from the group consisting of

- a C<sub>1-10</sub> alkyl group,
- a halogen atom selected from fluorine, chlorine, and bromine,
- a nitro group,
- a hydroxyl group,
- a C<sub>1-4</sub> lower alkoxy group,
- a C<sub>1-4</sub> lower alkylthio group,
- an acyl group,

a halo-C<sub>1-4</sub> lower alkyl group having a halogen atom selected from fluorine, chlorine, and bromine, and

an amino group that may be substituted with a C<sub>1-4</sub> lower alkyl or acyl group;

a 5- or 6-membered heterocyclic group having 1-3 nitrogen, oxygen or sulfur atoms or a 5- or 6-membered heteroarylalkyl group that may have 1-4 substituents selected from the group consisting of

- a straight chain or branched C<sub>1-10</sub> alkyl group,
- a halogen atom selected from fluorine, chlorine, and bromine,
- an acyl group,
- an oxo group, and

an halo-C<sub>1-4</sub> lower alkyl group having a halogen atom selected from fluorine, chlorine, and bromine; and

R<sub>2</sub> represents

a C<sub>1-4</sub> lower alkyl groups that may have 1-3 substituents selected from the group consisting of

- a C<sub>1-4</sub> lower alkoxy group,

an amino group that may be substituted with a C<sub>1-4</sub> lower alkyl or acyl group,

- a C<sub>1-4</sub> lower alkylthio group,
- a carbamoyl group,
- a hydroxyl group,
- a carboxyl group,
- an acyl group, and

a 5- or 6-membered heterocyclic group having 1-3 nitrogen,

oxygen, or sulfur atoms; or  
an aryl group that may have 1-4 substituents selected from the group consisting of

- a C<sub>1-4</sub> lower alkyl group,
  - a halogen atom selected from fluorine, chlorine, and bromine,
  - a nitro group,
  - a hydroxyl group,
  - a C<sub>1-4</sub> lower alkoxy group,
  - a C<sub>1-4</sub> lower alkylthio group,
  - an acyl group,
  - an amino group that may be substituted with a C<sub>1-4</sub> lower alkyl or acyl group, and
  - a halo-C<sub>1-4</sub> lower alkyl group having a halogen atom selected from fluorine, chlorine, and bromine,
- or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

5. The CETP activity inhibitor comprising as an active ingredient the compound as claimed in claim 1, which is selected from the group consisting of

- bis-[2-(pivaloylamino)phenyl] disulfide;
- bis-[2-(2-propylpentanoylamino)phenyl] disulfide;
- bis-[2-(1-methylcyclohexanecarbonylamino)phenyl] disulfide;
- bis-[2-(1-isopentylcyclopentanecarbonylamino)phenyl] disulfide;
- bis-[2-(1-isopentylcyclohexanecarbonylamino)phenyl] disulfide;
- N-(2-mercaptophenyl)-2,2-dimethylpropionamide;
- N-(2-mercaptophenyl)-1-isopentylcyclohexanecarboxamide;
- N-(2-mercaptophenyl)-1-methylcyclohexanecarboxamide;
- N-(2-mercaptophenyl)-1-isopentylcyclopentanecarboxamide;
- N-(2-mercaptophenyl)-1-isopropylcyclohexanecarboxamide;
- N-(4,5-dichloro-2-mercaptophenyl)-1-isopentylcyclohexanecarboxamide;
- N-(4,5-dichloro-2-mercaptophenyl)-1-isopentylcyclopentane-



carboxamide;  
     N-(2-mercapto-5-methylphenyl)-1-isopentylcyclohexane-  
 carboxamide;  
     N-(2-mercapto-4-methylphenyl)-1-isopentylcyclohexane-  
 carboxamide;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]thio-  
 acetate;  
     S-[2-(1-methylcyclohexanecarbonylamino)phenyl]  
 2,2-dimethylthiopropionate;  
     S-[2-(pivaloylamino)phenyl]phenylthioacetate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 2,2-dimethylthiopropionate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 2-acetyl-amino-3-phenylthiopropionate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 3-pyridinethiocarboxylate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 chloro-thioacetate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 methoxy-thioacetate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 thio-propionate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 phenoxy-thioacetate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 2-methylthiopropionate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 4-chlorophenoxythioacetate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 cyclo-propanethiocarboxylate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 2-acetyl-amino-4-carbamoylthiobutyrate;  
     S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
 2-hydroxy-2-methylthiopropionate;  
     S-[2-(1-isopentylcyclopentanecarbonylamino)phenyl]  
 2,2-dimethylthiopropionate;

S-[2-(1-isopentylcyclopentanecarbonylamino)phenyl]  
thio-acetate;

S-[4,5-dichloro-2-(1-isopentylcyclohexanecarbonylamino)-  
phenyl] 2,2-dimethylthiopropionate;

S-[4,5-dichloro-2-(1-isopentylcyclopentanecarbonylamino)-  
phenyl] 2,2-dimethylthiopropionate;

S-[2-(1-isopentylcyclohexanecarbonylamino)-4-trifluoro-  
methylphenyl] 2,2-dimethylthiopropionate;

O-methyl S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
monothiocarbonate;

S-[2-(1-methylcyclohexanecarbonylamino)phenyl]S-phenyl  
dithiocarbonate;

S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
N-phenylthiocarbamate;

S-[2-(pivaloylamino)-4-trifluoromethylphenyl]  
2,2-dimethylthiopropionate;

S-[4,5-dichloro-2-(1-cyclopropylcyclohexanecarbonylamino)  
phenyl] 2,2-dimethylthiopropionate;

S-[4,5-dichloro-2-(2-cyclohexylpropionylamino)phenyl]  
2,2-dimethylthiopropionate;

S-[4,5-dichloro-2-(1-pentylcyclohexanecarbonylamino)-  
phenyl] 2,2-dimethylthiopropionate;

S-[4,5-dichloro-2-(1-cyclopropylmethylcyclohexane  
carbonylamino)phenyl] 2,2-dimethylthiopropionate;

S-[4,5-dichloro-2-(1-cyclohexylmethylcyclohexanecarbonyl-  
amino)phenyl] 2,2-dimethylthiopropionate;

S-[4,5-dichloro-2-(1-isopropylcyclohexanecarbonylamino)-  
phenyl] 2,2-dimethylthiopropionate;

S-[4,5-dichloro-2-(1-isopentylcycloheptanecarbonylamino)-  
phenyl] 2,2-dimethylthiopropionate;

S-[4,5-dichloro-2-(1-isopentylcyclobutanecarbonylamino)-  
phenyl] 2,2-dimethylthiopropionate;

S-[2-(1-isopentylcyclohexanecarbonylamino)-4-nitrophenyl]  
2,2-dimethylthiopropionate;

S-[4-cyano-2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
2,2-dimethylthiopropionate;

S-[4-chloro-2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
2,2-dimethylthiopropionate;

S-[5-chloro-2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
2,2-dimethylthiopropionate;

S-[4-fluoro-2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
2,2-dimethylthiopropionate;

S-[4,5-difluoro-2-(1-isopentylcyclohexanecarbonylamino)-  
phenyl] 2,2-dimethylthiopropionate;

S-[5-fluoro-2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
2,2-dimethylthiopropionate;

bis-[4,5-dichloro-2-(1-isopentylcyclohexanecarbonylamino)-  
phenyl] disulfide;

2-tetrahydrofurylmethyl 2-(1-isopentylcyclohexanecarbonyl  
amino)phenyl disulfide;

N-(2-mercaptophenyl)-1-ethylcyclohexanecarboxamide;

N-(2-mercaptophenyl)-1-propylcyclohexanecarboxamide;

N-(2-mercaptophenyl)-1-butylcyclohexanecarboxamide;

N-(2-mercaptophenyl)-1-isobutylcyclohexanecarboxamide;

S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
cyclo-hexanethiocarboxylate;

S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
thio-benzoate;

S-[2-(1-isopentylcyclohexanecarbonylamino)phenyl]  
5-carboxythiopentanoate;

S-[2-(1-isopentylcyclohexanecarbonylamino)-4-methylphenyl]  
thioacetate;

bis-[2-[1-(2-ethylbutyl)cyclohexanecarbonylamino]phenyl]  
disulfide;

N-(2-mercaptophenyl)-1-(2-ethylbutyl)cyclohexane-  
carboxamide;

S-[2-[1-(2-ethylbutyl)cyclohexanecarbonylamino]phenyl]  
2-methylthiopropionate;

S-[2-(1-isobutylcyclohexanecarbonylamino)phenyl]  
2-methyl-thiopropionate;

S-[2-[1-(2-ethylbutyl)cyclohexanecarbonylamino]phenyl]  
1-acetylpiperidine-4-thiocarboxylate;

S-[2-[1-(2-ethylbutyl)cyclohexanecarbonylamino]phenyl]thioacetate;

S-[2-[1-(2-ethylbutyl)cyclohexanecarbonylamino]phenyl]2,2-dimethylthiopropionate;

S-[2-[1-(2-ethylbutyl)cyclohexanecarbonylamino]phenyl]methoxythioacetate;

S-[2-[1-(2-ethylbutyl)cyclohexanecarbonylamino]phenyl]2-hydroxy-2-methylthiopropionate;

S-[2-[1-(2-ethylbutyl)cyclohexanecarbonylamino]phenyl]4-chlorophenoxythioacetate;

S-[2-(1-isobutylcyclohexanecarbonylamino)phenyl]4-chloro-phenoxythioacetate; and

S-[2-(1-isobutylcyclohexanecarbonylamino)phenyl]1-acetyl-piperidine-4-thiocarboxylate,  
or a prodrug compound, a pharmaceutically acceptable salt, a hydrate,  
or a solvate thereof.

6. A prophylactic or therapeutic agent for hyperlipidemia comprising as an active ingredient the compound as claimed in claim 1, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

7. A prophylactic or therapeutic agent for hyperlipidemia comprising as an active ingredient the compound as claimed in claim 2, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

8. A prophylactic or therapeutic agent for hyperlipidemia comprising as an active ingredient the compound as claimed in claim 3, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

9. A prophylactic or therapeutic agent for hyperlipidemia comprising as an active ingredient the compound as claimed in claim 4, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

10. A prophylactic or therapeutic agent for hyperlipidemia comprising as an active ingredient the compound as claimed in claim 5, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

11. A prophylactic or therapeutic agent for atherosclerosis comprising as an active ingredient the compound as claimed in claim 1, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

12. A prophylactic or therapeutic agent for atherosclerosis comprising as an active ingredient the compound as claimed in claim 2, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

13. A prophylactic or therapeutic agent for atherosclerosis comprising as an active ingredient the compound as claimed in claim 3, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

14. A prophylactic or therapeutic agent for atherosclerosis comprising as an active ingredient the compound as claimed in claim 4, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

15. A prophylactic or therapeutic agent for atherosclerosis comprising as an active ingredient the compound as claimed in claim 5, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

16. A method for inhibition of CETP activity comprising administering to patients the compound as claimed in claim 1, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

17. A method for prevention or therapy of hyperlipidemia comprising administering to patients the compound as claimed in claim 1, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.

18. A method for prevention or therapy of atherosclerosis comprising administering to patients the compound as claimed in claim 1, or a prodrug compound, a pharmaceutically acceptable salt, a hydrate, or a solvate thereof.